RT APPENDIX → DESCRIPTION 101557 ORIGINAL (Red)

SOUTHERN MARYLAND WOOD TREATING CORPORATION
Subsidiary
of
L. A. CLARKE & SON, INC.
P. O. Box 37
Hollywood, MD 20636

SPCC PLAN
January 27, 1977

SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN

Prepared
by

RENTOKIL INCORPORATED
TACO Wood Preserving Division
P. O. Box 2909
Spartanburg, SC 29304

Certified
by

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W. Henry Caban, P. E.

AR100007

ORIGINAL (Red)

SOUTHERN MARYLAND WOOD TREATING CORPORATION
Subsidiary of
L. A. CLARKE & SON, INC.
Hollywood, Maryland

DESCRIPTION OF FACILITY

Southern Maryland Wood Treating Corporation, a Wood Preserving Plant, is located on State Route 235 north of Hollywood, Maryland and is engaged in the pressure treatment of poles, piling and lumber with coal tar creosote and pentachlorophenol/petroleum.

The attached TACO Dwg. No. 42-T-33 is a carefully thought out plan in accordance with good engineering practices illustrating the complete Spill Prevention Control and Countermeasures Plan for this onshore facility.

A. The principle vessels containing creosote and penta petroleum solution involved in the normal conduct of the pressure treating process are as follows:

1.	No. 1 Retort - 72" i.d. x 75' long	max. capacity-	16,000 gallons
2.	No. 2 Retort - 72" i.d. x 50' long	-	10,600 "
3.	No. 1 Working Tank (creosote) 10'-6" dia x 31' high	-	20,000 "
4.	No. 2 Storage Tank " ditto	-	20,000 "
5.	No. 3 Working Tank (5% penta) 10'-6" dia x 22' high	-	14,000 "
6.	No. 4 Storage Tank " ditto	-	14,000 "
7.	Penta Mixing Tank - 66" dia x 6' high	-	1,000 "
8.	Air Receiver - 54" dia x 14' long	-	1,600 "
9.	Water Storage Tank - 10'-6" dia x 31" high	-	20,000 "
10.	Barometric Condenser		

Note: All of the above vessels are in place and operational except item 9.

The principle vessels to be used for receiving, containing and processing the effluent from the process are as follows:

*1.	Barometric Condenser Hotwell -	-	1,000 gallons
*2.	Barometric Condenser Water Reservoir -	-	15,000 "
3.	Creosote Sump Tank - 4' dia x 4' deep -	-	400 "
4.	Creosote Decanter - 8' dia x 30' high -	-	10,000 "
5.	Creosote Separators - 8' x 20' x 4' high -	-	4,800 "
6.	Creosote Dehydrator - 8' dia x 16' high -	-	5,000 "
7.	Penta Sump Tank - 3' dia x 4' deep -	-	200 "
8.	Penta Decanter - 4' dia x 10' high -	-	1,000 "
9.	Penta Separator - 8' x 16' x 4' high -	-	4,000 "
10.	Reclaimed Penta Storage Tank - 4' dia x 10' high-	-	1,000 "
11.	" " Sump Tank - 3' dia x 4' deep	-	200 "
*12.	Creosote Waste Water Pond - 40' x 40' x 3' deep	-	36,000 "
*13.	Penta Waste Water Pond - 40' x 50' x 3' deep	-	45,000 "
14.	Waste Water Spray Evaporation Pond-50'x75'x4' deep	-	100,000 "

*Note: These items are operational. Balance under construction and to be installed.

The mechanical equipment required for the process and transfering of treating solutions is as follows:

1. Oil fired steam boiler
2. Motor driven air compressor
3. Motor driven transfer pumps
4. Motor driven pressure pumps
5. Motor driven vacuum pump
6. Motor driven water pumps
7. Motor driven sump pumps

Note: All in place & operational except item 7.

B. DESCRIPTION OF THE WOOD PRESERVING PROCESS

The predominant specie of wood treated at this plant is Southern Yellow Pine. The products consist of poles, piling, posts, timbers and lumber. Most of the material is freshly cut and not air dried or kiln dried and must be steam conditioned before treatment. The material is loaded by fork lift trucks on tram cars which travel on a narrow gauge railroad track. The loaded tram cars are pushed into the retort by a rubber tired fork lift truck. The retort door is closed and bolted tight with a pneumatic impact wrench to resist 200 psi working pressure. Live steam is introduced into the retort and the timber products are subjected to steaming at 245° F (approx. 13 psig) for a period not to exceed 20 hours, the duration depending on the kind and size of the product and the initial moisture content of the wood. During steaming, the condensate is continuously drained from the bottom of the retort and is disposed of through the effluent disposal system. After the steaming period is concluded the pressure is relieved from the top of the retort to the atmosphere and a vacuum is impressed on the retort for about two hours at a magnitude of 22" of mercury by a vacuum pump and a barometric condenser to remove a considerable amount of moisture from the wood. This constitutes the steam conditioning cycle. The material is now ready for impregnation with preservat typically by the empty cell process. Compressed air is initially applied to the retort in the order of 25 psi to 50 psi or higher depending on the amount of preservative to be retained in the product. Typically, wood products are treated to retain 8, 10, 12, 20 or even more pounds of preservative per cubic foot of wood depending on the end use of the product. Against this initial air pressure, the retort is pumped full of preservative by a transfer pump, after which a pressure pump is employed to raise the hydraulic pressure up to 200 ps and held until sufficient preservative is absorbed by the wood to meet the requirements of the specific charge of material in the retort. At the end of the pressure period, the excess preservative is either forced by compressed air or pumped back to the working tank. A final vacuum period for about one hour at a magnitude of 22" of mercury or higher concludes the process and any preservative exuded from the wood is also returned to the working tank. The difference in the contents of the working tank before and after treatment indicate the amount of preservative retained by the material in the charge. Operator experience and skill is required to assure the proper preservative retention in each charge of material.

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C. SPILL PREVENTION CONTROL

The structures and equipment for the containment of any spills from this onshore facility consist of the following:

1. Concrete block dike measuring approx. 19' x 69' x 32" high inside with a capacity of approx. 25,000 gallons contains the working, storage and penta mixing tanks, the largest of which is 20,000 gallons.

2. Concrete block treating room measuring approx. 30' x 71' inside the walls with a capacity of approx. 16,000 gallons per foot contains the treating retorts, the largest of which contains up to 12,000 gallons of creosote in process.

3. Steaming condensate from the retorts, contaminated with creosote or penta or any spills of creosote or penta, shall be separately drained to the creosote/penta sumpage settling and reclaim system. This system shall be erected on a 30' x 40' concrete curbed slab to contain any spills from the system. The creosote/waste water drains by gravity to a sump tank and is automatically pumped to the decanter for primary settling. The overflow drains by gravity to the creosote separator and the creosote is periodically pumped out to the dehydrator while the waste water drains by gravity to the temporary holding pond. Each batch of dehydrated creosot is returned to the working or storage tanks at the treating plant. The waste water from the holding pond is pumped to the evaporation spray pond or recycled thru the decanter, etc. if necessary. The penta/waste wate drains by gravity to a similar system except that the penta is recovered automatically into a reclaimed penta storage tank and when full, the penta is returned to the working tank. The waste water drains by gravity to the temporary holding pond, after which it is pumped to the evaporation spray pond or recycled thru the settling system if necessary.

4. The waste water from the temporary holding ponds shall be pumped as required to the evaporation spray pond. The holding capacity of the spray pond which measures 50' x 75' x 4' deep is approx. 100,000 gallons @ 3'-6' depth. This is estimated to be a 60 day holding supply without evaporation. This pond shall be equipped with a 200 gpm circulating pump and piping system with 36 fog nozzles. At 5% evaporation rate in a normal 8 hour da at 50% relative humidity, this system should evaporate approx. 5,000 gallons per day. It may be necessary to install a heat exchanger at the pond to maintain a desirable evaporation rate at all times throughout the yea

5. It is anticipated that the waste waters from the four additional lagoons, give enough time to do it, can be recycled through the sumpage settling & reclair system and ultimately through the evaporation spray pond. After this is done, the four lagoons can be filled in, leveled off and the terrain restored to original grade.

D. Heating Coil Condensate from retort heating coils and tank heating coils should be returned direct to the feed water storage tank in the absence of preservative leaks into the coils. When in doubt or when coil leakage is observed, then the condensate should be directed through the heat exchanger inside the feed water storage tank and wasted to the barometric condenser water reservoir as make-up water. Otherwise, the coil condensate should be drained, same as steaming condensate, to the creosote/penta sumpage settling and reclaim system.

E. Visible Leaks from pipe connections and gaskets shall be promptly observed and corrected and the spills cleaned up. However, any such leaks or spills cannot escape the containment curbs and retaining walls. Any such spills shall be picked up by a portable sump pump and returned to available tanks or drained and processed through the sumpage settling and reclaim system.

F. 1. A separate concrete curbed drip basin, approx. 8' x 10', shall be provided at the location normally used for unloading tank trucks of creosote or petroleum solvent for penta. Any spills occuring during unloading should be picked up by a portable sump pump and reclaimed. This basin should be covered when not in use.

2. A separate concrete curbed drip basin, approx 6' square, shall be provided over the 5,000 gallon underground fuel oil storage tank. This basin should be covered when not in use.

G. Vacuum Pump Seal Water should be derived from the 20,000 gallon water storage tank on a once through system with the uncontaminated waste draining to the surface water pond. The rate required is 15 gpm @ 25 psi or approx. 900 gph during vacuum operation. The barometric condenser water should not be used as vacuum pump seal water because of its highly corrosive action on the internals of the pump.

H. SUMMARY

This SPCC Plan when fully implemented shall enable this plant to contain and control any possible creosote or penta petroleum oil spills and reclaim 100% of such spillage. In addition, the installation of the evaporation spray pond should put this plant well on its way toward zero effluent discharge which is our ultimate goal.

Respectfully submitted and certified by:

W. Henry Caban, P.E.
W. Henry Caban, P. E.

Date January 27, 1977
At Spartanburg, South Carolina

HISTORY - 1

Includes: Sample results
Remediation plans
Hydro-Geo.
Theory of Remediation.

INTRODUCTION

In August, 1981, work should begin on the renovation of an out-of-service wood processing facility located on a 130 acre site in St. Mary's County, Maryland. The project represents a cooperative effort between regulatory and service agencies and the private sector to clean up a significant hazardous waste problem in a fairly commonplace industrial operation.

BACKGROUND

In the summer of 1975, inspectors of the Maryland WRA determined that the waste practices at a wood treating facility in St. Mary's County, Maryland, may be impacting ground water. Subsequent investigation indicated that wastewater from a creosote and pentachlorophenol (penta) wood preserving operation was being discharged to unlined "evaporation lagoons." While the practice was obviously unacceptable, the regulatory programs at that time were not designed to handle ground water discharges. After much discussion, it was decided that the most likely plan for this facility was to construct a recycle/treatment facility utilizing spray irrigation for excess wastewaters. Under this scheme, most of the penta and creosote would be recycled. Wastewater containing tannins and lignins in addition to waste preservatives would be lagooned and disposed

of by spray irrigation. The estimated discharge would be about 1,000 gpd on an annual basis.

In addition to the ongoing problem, the company would be required to renovate the existing lagoons and clean up the area. In August of 1977, a State Discharge Permit was issued requiring the development of a plan for site renovation and requiring the construction of a wastewater treatment facility. During the summer of 1977, the State obtained some composted sewage sludge to incorporate into the contaminated soils to determine if biodegradation by land farming was possible.

When the test proved successful, the original plan was modified to include onsite renovation of soils contaminated by the waste ponds. The idea was to construct three spray irrigation fields. One would be in use, one as a back-up and the final one to reclaim the contaminated soils. Each year a portion of the contaminated soils would be mixed with compost, tilled and seeded. The following year, that site would be rotated into spray irrigation use. Any remaining liquid waste in the ponds would be treated in the first year with the normal plant waste.

SITE INVESTIGATION

In 1975, samplings of waters in a spring fed "fresh water pond" near the wood treating facility showed phenolic concentrations of 1.80 mg/l. Analyses of oily material floating on the pond was determined to contain 77.5 mg/l of phenolics. There was no evidence of a surface connection between the plant's waste ponds and the fresh water pond. It was observed at the site that the oily material was "bubbling" up from the spring end of the pond.

These observations made it necessary to consider the imposition of site renovation conditions on the property owner. To support the conditions, a field investigation was begun.

On May 6, 1975, three monitoring wells were installed in augered soil borings. Field investigators noticed strong phenolic odors in soil samples 9 to 13 ft. below the surface. The monitoring wells were constructed with 1½" PVC schedule #40 pipe with 5' slotted screens. The screens were located approximately 15' to 20' below the surface. The water table was between 1½ to 3½ feet from the surface.

The boring logs showed that a coarse to fine silty sand formation existing from the surface to a depth of 15' to 20'. Below this

is a sandy, blue/black clay which extended to a depth of at least 50 feet. Water samples obtained from these wells on June 11, 1975, showed concentrations of phenols of 1.0 ppm, 9.0 ppm, and 14.4 ppm. The pH of the ground water ranged from 5.5 to 5.7. The ground water flow determined from water elevations in the monitoring wells was from the wastewater holding ponds to the fresh water pond. The conclusions of this interdepartmental study was that waste phenolics in the ponds had percolated into the ground water and then migrated to the fresh water pond.

The stream which drains the fresh water pond was studied by a private consultant. In that study, a water sample taken approximately 300 yds. below the pond contained 0.12 ppm phenol. The consultant reported that few aquatic insects were found in this section of the stream. However, phenol concentrations decrease and the biomass increases substantially within ¼ mi. from the first sample point. The data indicates a significant improvement of water quality as the distance from the fresh water pond increases.

To support the pending legal actions, a more detailed hydrogeologic investigation was conducted. On December 7, 1978, WRA investigators sampled ground and surface waters. A sample of the ground water from one of the wells installed in 1975

showed creosote concentrations of 1.6 ppm and pentachlorophenol concentrations of 1.34 ppb. Analyses of liquid samples in the holding ponds showed PCP concentrations ranging from 0.62 ppb to 66.06 ppb and creosote concentrations ranging from 0.654 ppm to 70.72 ppm. Analyses of the stream samples showed PCP ranging from 0.01 ppb to 27.0 ppb and creosote concentrations ranging from <0.001 ppm to 1.769 ppm. Pentachlorophenol and creosote concentrations in the fresh water ponds were 0.01 ppb and 0.308 ppm, respectively[1].

Samples taken at various monitoring wells on the site indicated that the phenolic concentrations increased with depth until the water table was intercepted. At the water table, analyses showed a band of high phenolic concentration that indicated that the wood preservatives were "floating" on the ground water. Sampling of shallow dug residential wells in the area failed to substantiate the County Health Department's sampling that showed high phenolics. Samples also showed phenolics in monitoring wells up the hydrologic gradient from the facility. We theorized that an air vector was responsible for carrying vapors from the venting of the pressure vessels to these sites. This theory will never be tested as the site is shut down.

TECHNICAL BASIS FOR THE RENOVATION PLAN

Renovation of the wood preserving plant incorporates basic biological wastewater treatment processes currently used in the wood preserving industry[2]. For this project, freshly composted sludge from the Washington, D.C. Wastewater Treatment Plant will be mixed with the creosote and penta contaminated soils to accelerate biological degradation. The composted sludge provides a biologically active soil addition containing up to 25 percent (by weight) dead and living microorganisms. Bacteria, actinomycetes and fungi comprise most of the active microbial population[3].

Since the contaminants are by nature, bacteriacides, the microorganisms introduced to the contaminated soils will undergo some acclimation. Following acclimation, however, creosote reductions exceeding 90 percent have been observed in activated sludge and soil irrigation wastewater treatment processes. Additionally, penta reductions exceeding 99 percent, during a 50-day period, have been reported in a bench-scale study utilizing activated sludge treatment[4]. Increased soil organic matter has also been shown to expedite penta degradation within the soil medium[5].

The composted sludge to be used for site renovation will be

composted for 21 days and in lieu of the usual curing process will be applied to the site. Incorporation of the composted sludge into the waste contaminated soils will not only restore the microbe population but create soil conditions more optimum for biological activity. These soil conditions include pH, structure, moisture and temperature. The compost contains approximately 15 percent limestone and has a pH near neutral. At the planned application rate 125-130 tons/acre, the composted sludge should adjust the previously acid soils to a pH more condusive to microbial activity.

The subsoils on the site range from sandy to clayey. Incorporation of the composted sludge into sandy or droughtly soils increases the moisture holding capacity of the soil. In a clayey or compacted soil, the incorporated compost enhances soil structure allowing better water and gas exchange within the soil and thus promoting a more aerobic environment.

Soil temperature will be affected not only by microbial activity, by by ability to hold solar radiation. The existing soil color will be darkened by the composted sludge additions. The darker soil color should maintain warmer soil temperatures later in the fall and early in the spring and consequently enhance biological activity during colder months of the year.

In addition to microbial degradation of the creosote and penta contaminants, sunlight should contribute to the destruction of other phenolics and wood chemicals particularly in existing lagoon and "fresh water" pond areas.

Contaminants which have leached past the zone of microbial activity in the soil, are expected to eventually disappear via dilution.

Following seeding, the composted amended soils should be more than adequate to promote revegetation of the site[6].

METHOD OF SITE RESTORATION

Site restoration for this facility is to be executed according to plans prepared by Lyon Associates, Inc. of Baltimore, Maryland. Following general site inspection, all supply and test wells are to be abandoned and sealed. The lagoons are to be drained and spray irrigated in a designated disposal area. Following this procedure all containers will be cleaned and stored on site for removal. At the same time the lagoons will be breached to prevent further ponding of water.

Following dewatering, all contaminated structures in the pond area such as cement foundations, steel pipes, etc., shall be removed and hauled to an approved hazardous waste facility. Proper erosion and sediment controls will be utilized during the land clearing.

The "fresh water" pond will be dewatered by breaching the embankment. Sediment control will be maintained downstream from the pond by using soil erosion control fencing. Since the pond is spring fed, spray irrigation may be utilized at the discretion of the contractor.

The earthwork will involve uniform regrading of the lagoon area maintaining slopes less than 1 to 2. The fresh water

pond embankment will also be removed.

following regrading, composted sludge will be applied to the entire site at the rate of 125-130 ton/acre (approximately 2 inches) and tilled into the top 4 to 6 inches of soil. The site shall then be hydroseeded and the grass mowed as required during the growing season.

SUMMARY

When this project was begun five years ago, the State had in mind several objectives. The first was to demonstrate the feasibility of reclaiming a hazardous waste site. At the time this renovation began, RCRA and other laws governing safe disposal of hazardous wastes were just being discussed and the techniques applied here were somewhat unique. The second objective was the development of low cost, unsophisticated solutions to waste problems to encourage cooperation and participation by industry in cleaning up their own problems. Too often, over-zealous enforcement combined with unclear and overly restrictive technical support have caused activities to occur in the court room with technically ill-prepared judges making decisions instead of renovation of a site by experts. Finally, from a management standpoint, we desired to treat or destroy hazardous wastes at, or as close to, the point of generation as possible. This technique eliminates possible transportation accidents and the prospect of creating two hazardous waste problems instead of one.

It is important that whenever we find situations such as this one, we avoid using the lack of a perfect solution as an excuse to put the problem in the hands of the next generation.

end

REFERENCES

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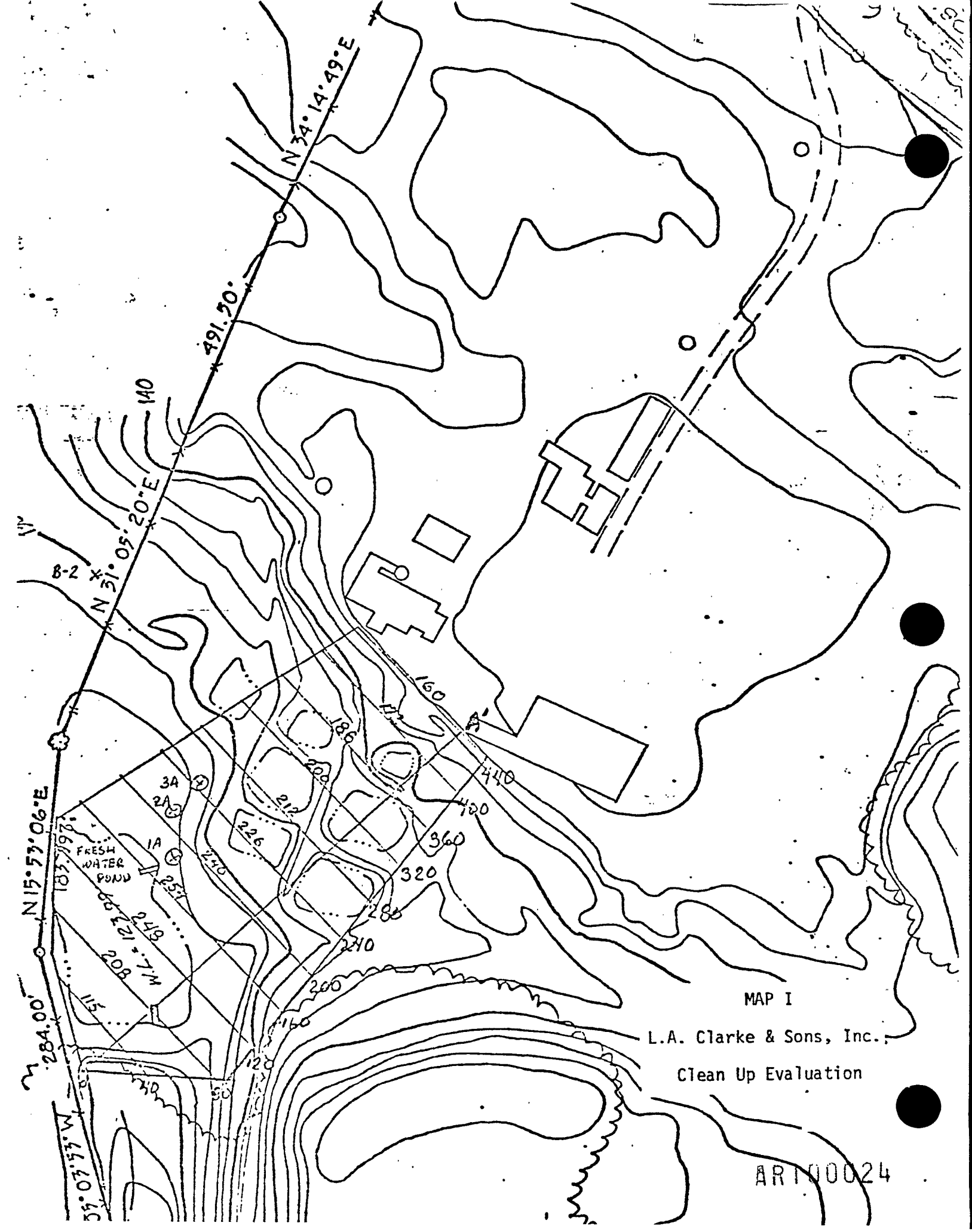
2. Ramsey, W. L., In-House Memorandum. Water Resources Administration, Maryland Department of Natural Resources, 1979.

3. Poincelot, R. P., "The Biochemistry of Composting," in Proc. 1977, National Conference on Composting of Municipal Residues and Sludges.

4. Dust, J. V. and Thompson, W. S., 1973, "Pollution Control in the Wood Preserving Industry," Part 4, Biological Methods of Treating Wastewater, Forest Products J. 23(9):59-66.

5. Kuwatsuka, S., "Degradation of Several Herbicides in Soils Under Different Conditions," Environmental Toxicology of Pesticides, F. Matsumura, G. M. Bouch and T. Masato, Eds. (New York: Academic Press, 1972), pp. 385-400.

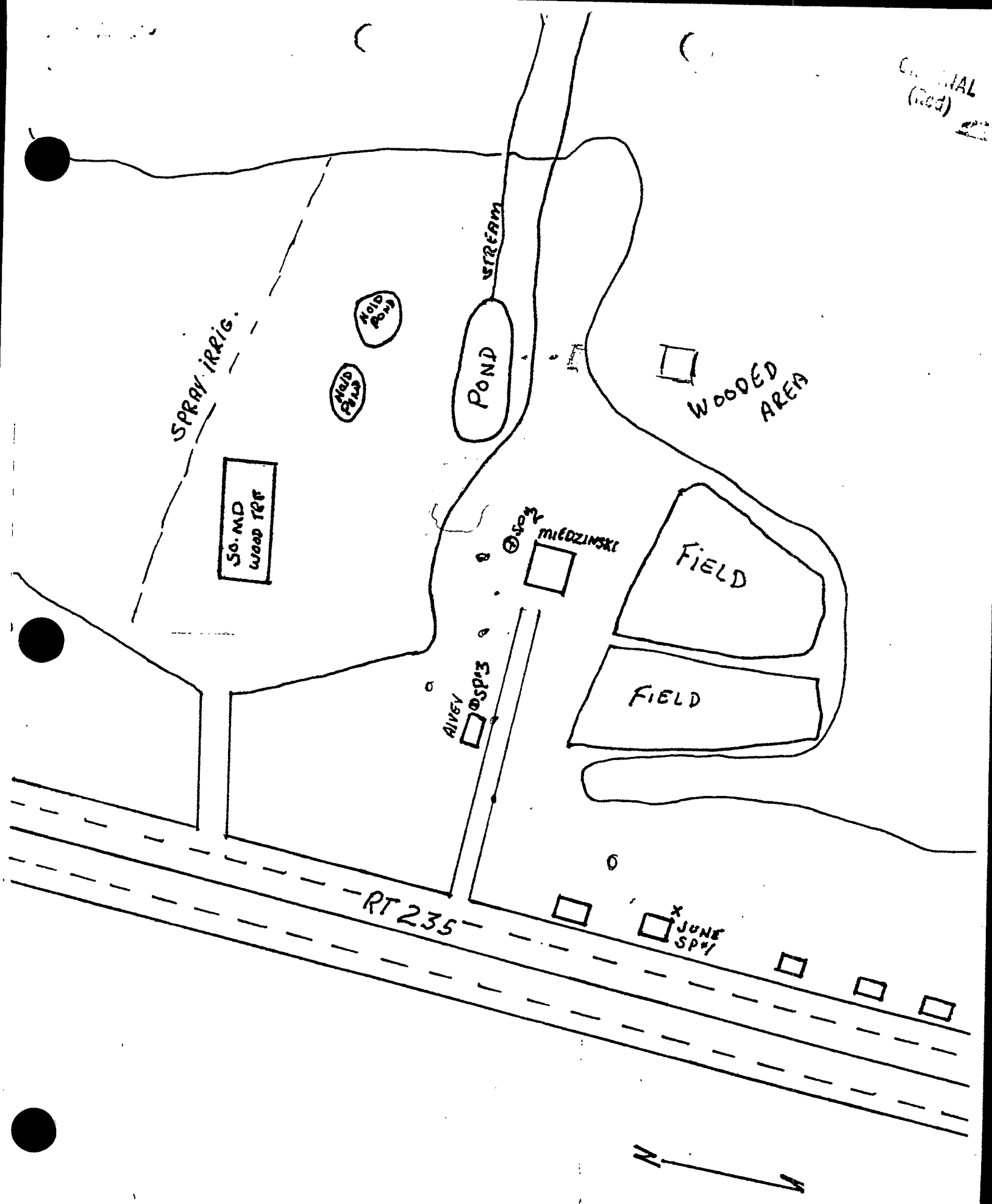
6. Hornick, S. B., et al., "Use of Sewage Sludge Compost For Soil Improvement and Plant Growth," U. S. Department of Agriculture Science and Education Administration, Agricultural Reviews and Manuals. ARM-NE-6, August, 1979.



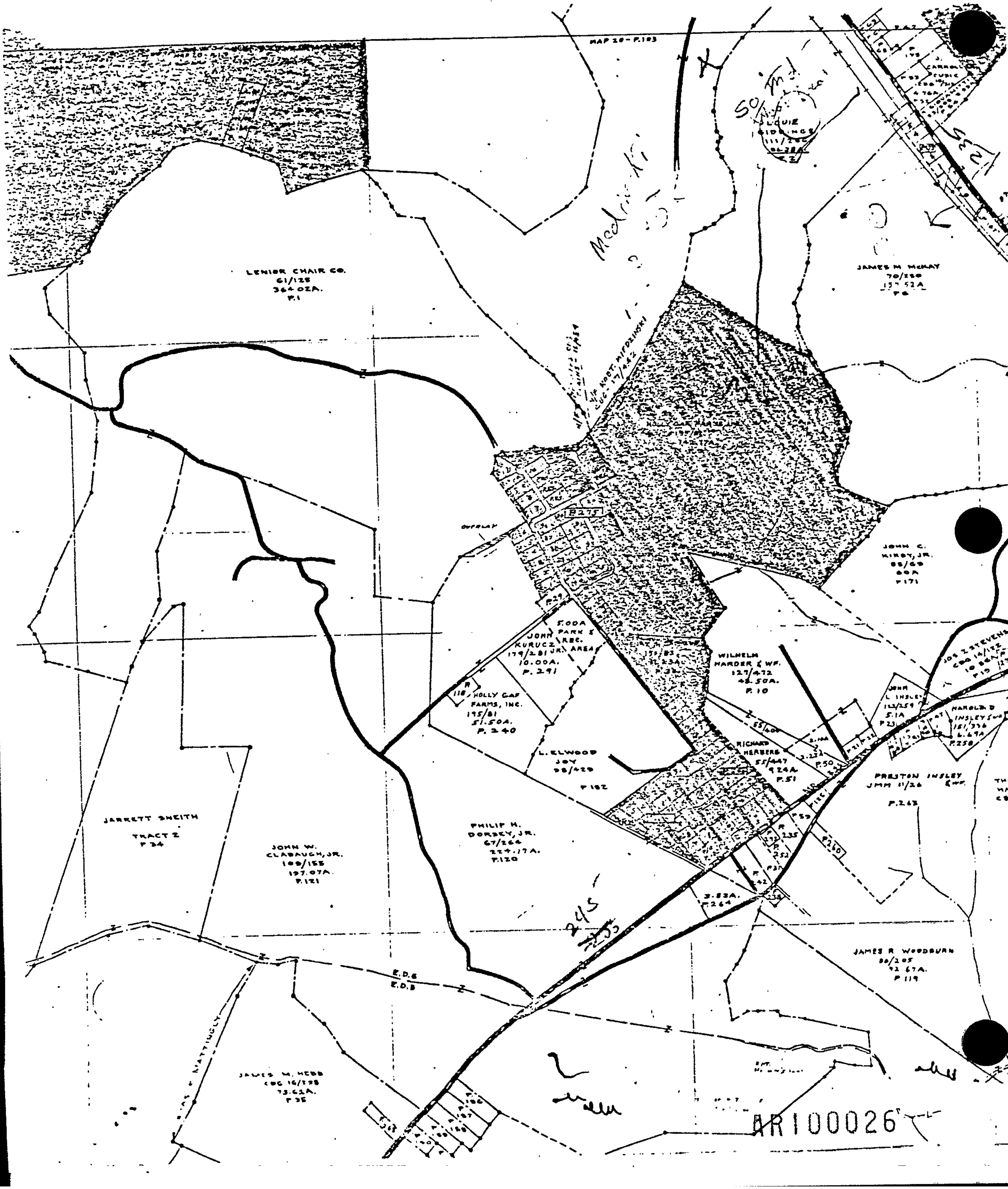
MAP I

L.A. Clarke & Sons, Inc.

Clean Up Evaluation


SPRAY IRRIG.
MOLD PLOTS
MOLD PLOTS
STREAM
POND
WOODED AREA
SO. MD WOOD TRF
SP#2
MILEOZINSKI
FIELD
FIELD
AIVEY
SP#3
RT 235
JUNE SP#1
N
NOT TO SCALE

(20)


MAP 20 - P.193
LENIOR CHAIR CO.
61/125
364.02A.
P.1
JAMES M. McKAY
70/250
JOHN C. KIRBY, JR.
OVERLAY
5.00A
PARK & REC. AREA
JOHN KURUCZ JR.
179/281
10.00A.
P.291
HOLLY GAP FARMS, INC.
195/81
51.50A.
P.240
L. ELWOOD JOY
95/429
P.182
WILHELM HARDER & WF.
127/472
45.50A.
P.10
RICHARD HERBERG
55/447
9.24A.
P.51
JOHN L. INSLEY
113/259
5.1A
HAROLD D. INSLEY & WF.
151/376
6.69A
P.258
PRESTON INSLEY & WF.
JMM 11/26
P.263
JARRETT SMITH
TRACT 2
P.34
JOHN W. CLABAUGH, JR.
109/155
197.07A.
P.121
PHILIP H. DORSEY, JR.
67/264
224.17A.
P.120
3.83A.
P.264
JAMES R. WOODBURN
30/205
92.67A.
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E.D.6
E.D.8
JAMES M. HEBB
CBG 16/178
73.61A.
P.35

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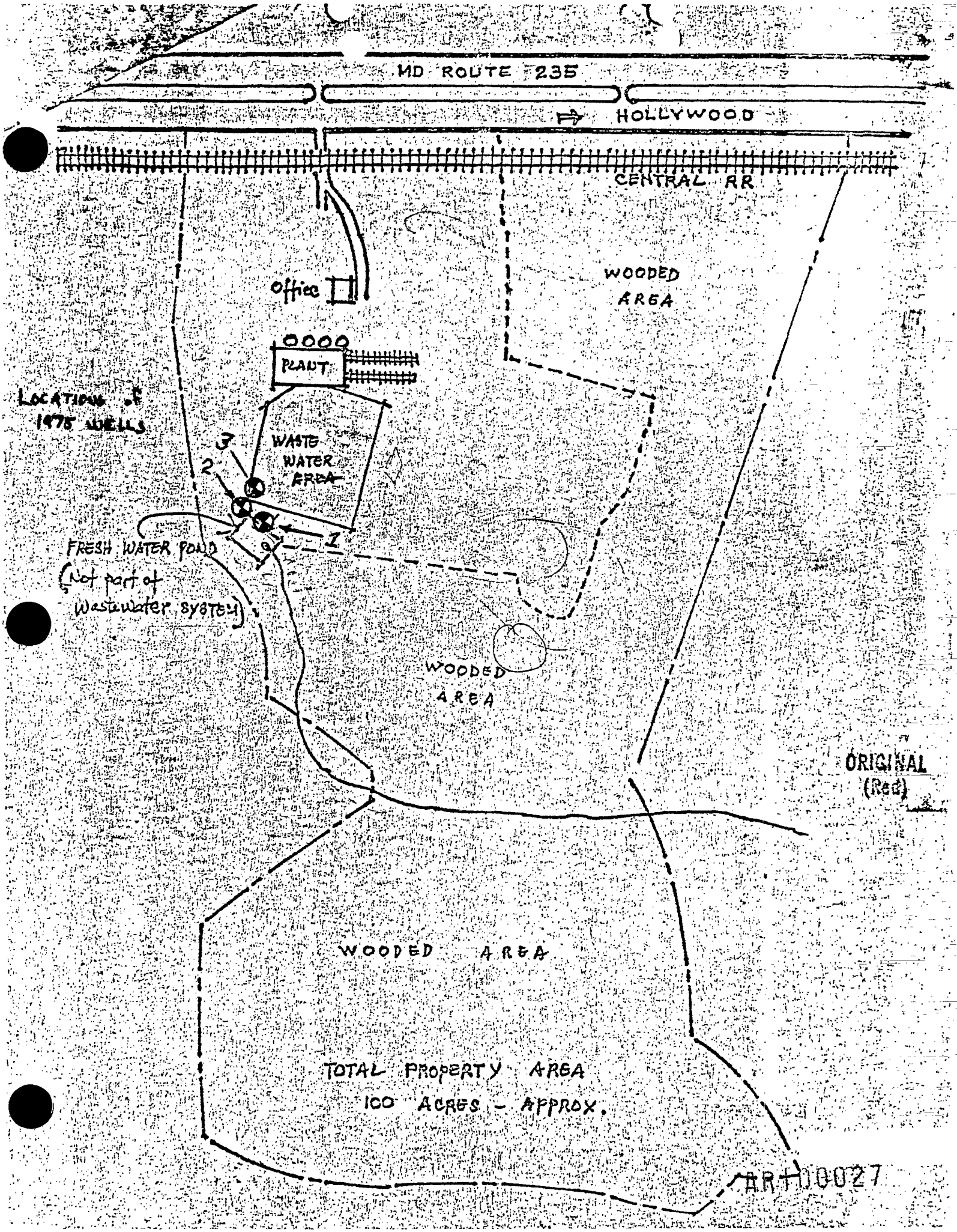
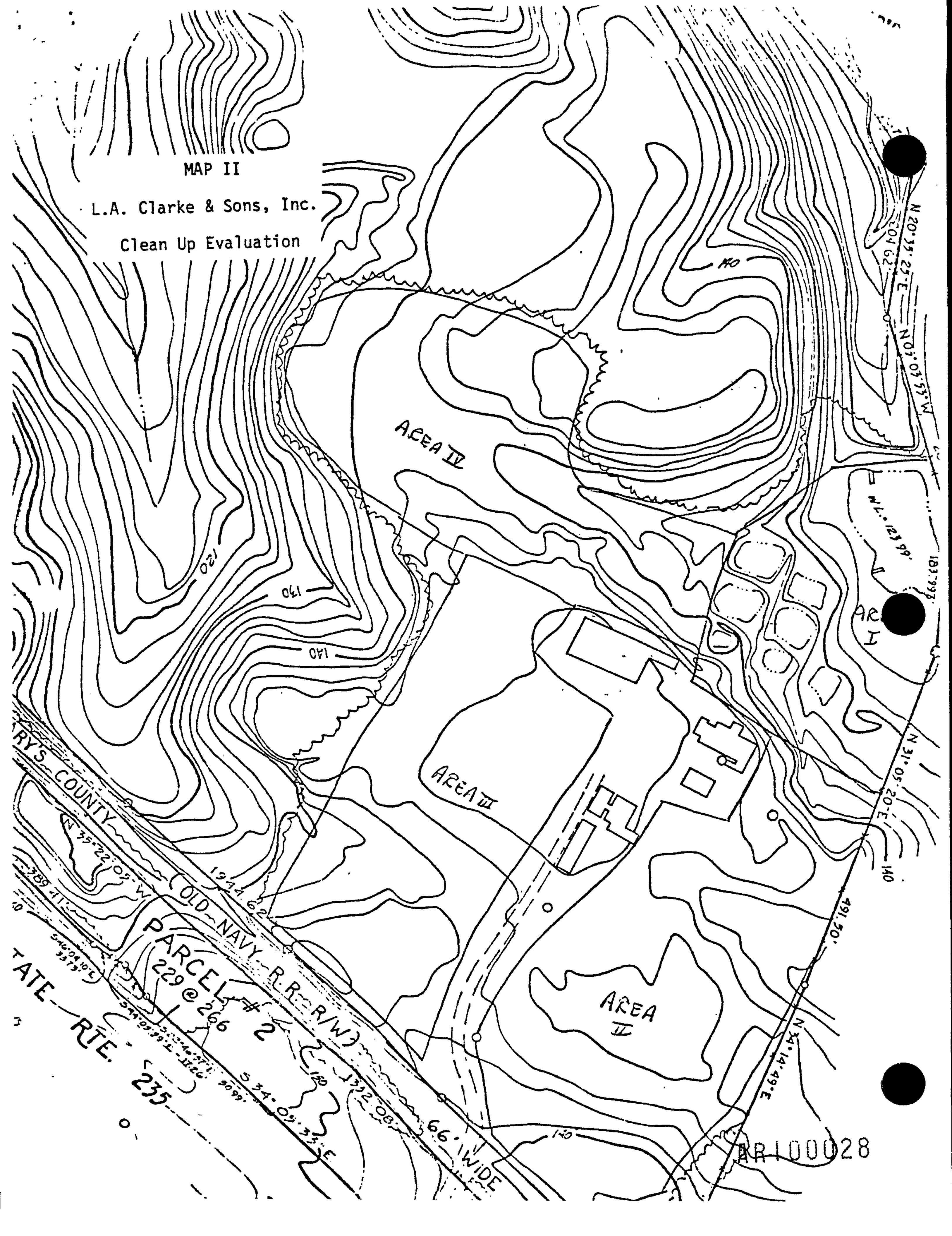

MD ROUTE 235
HOLLYWOOD
CENTRAL RR
Office
PLANT
WOODED AREA
LOCATIONS OF 1975 WELLS
3
2
1
WASTE WATER AREA
FRESH WATER POND
(Not part of Wastewater system)
WOODED AREA
ORIGINAL (Red)
WOODED AREA
TOTAL PROPERTY AREA
100 ACRES - APPROX.


MAP II
L.A. Clarke & Sons, Inc.
Clean Up Evaluation
AREA IV
AREA III
AREA II
120
130
140
RY'S COUNTY
(OLD NAVY R.R. R/W)
66' WIDE
PARCEL #2
229@266
TATE RTE. 235
1944.62
1312.08
491.30'
N 31°05'20" E

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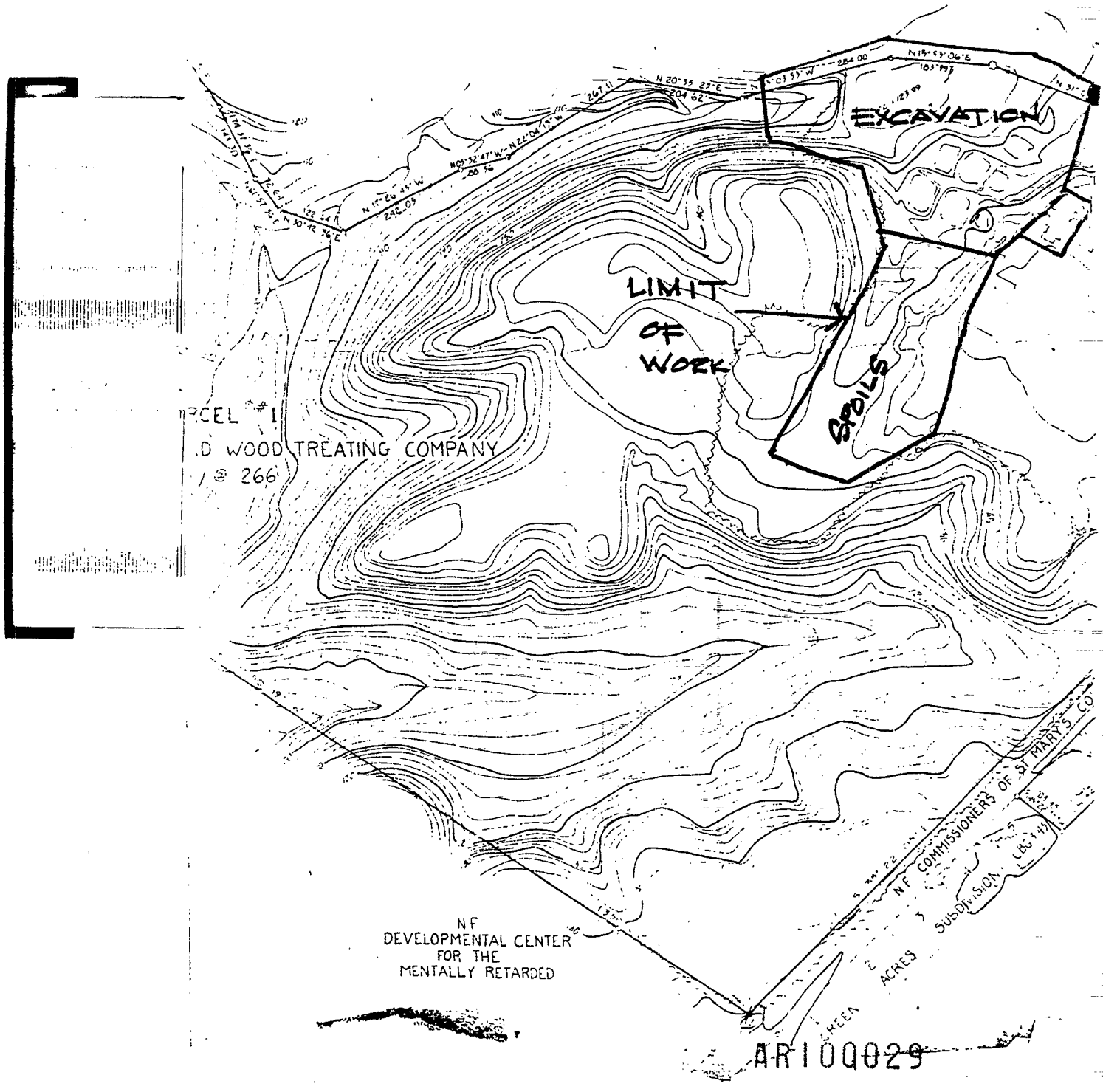
(Red)



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